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ABSTRACT

In areas such as Latin America and the Caribbean, many institutions are setting up databases using existing computerized information and documentation networks, and relying on new microcomputer equipment for their implementation. Increasing awareness of the implications of this practice prompted this conference, which provided the first step of a regional effort oriented toward the following objectives: (1) identifying and examining experiences with microcomputer-based bibliographic information systems; (2) discussing basic functional microcomputer software specifications to meet the needs of users; (3) reviewing methodologies for analyzing existing commercial and non-commercial microcomputer-based bibliographic information retrieval and dissemination software; (4) examining the feasibility of creating or modifying software to make the systems of the institutions of the region more accessible, compatible, and portable; (5) analyzing problems raised by the exchange of data and software between different microcomputers, with emphasis on standards for the structure and content of data; and (6) identifying cooperative schemes for resolving problems, including suitable mechanisms for technical assistance, training, and research and development. Recommendations in the areas of software evaluation, data exchange, and the future of software packages for information handling are offered. Appendices include: a list of participants; a list of acronyms of institutions, information networks, and software packages; a conference agenda; abstracts of presentations; features of software packages examined; and copies of the documentation distributed. (THC)

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MEETING
MICROCOMPUTERS AND BIBLIOGRAPHIC INFORMATION SYSTEMS
IN LATIN AMERICA:
PROBLEMS, EXPERIENCES AND PROJECTIONS
Santiago, Chile
24 to 27 April 1984

Santiago de Chile

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I. INTRODUCTION

The use of microcomputer technology is rapidly expanding in developing regions. In areas such as Latin America and the Caribbean many computerized information and documentation networks are in place and many institutions are setting up their own data bases relying upon the new microcomputer equipment for their implementation. It is to be expected that this trend will have both positive and negative implications.

On the positive side, the access to low cost microcomputer technology in addition to systems based on larger equipment opens many opportunities for a wider use of computer systems by small documentation and information centres and libraries. This technology also provides for easy and inexpensive access to information by geographically scattered users through network links and information interchange.

On the negative side, the characteristics and rate of change of the international software and hardware market related to microcomputer systems may impact the developing countries in an adverse manner. Incompatibility among the technologies available and the lack of agreement on standards and formats for data interchange may create increased barriers to communication among the various institutions that generate and collect specialized literature, whether or not they are participating in information networks.

The increasing awareness of this dilemma created a favorable atmosphere for organizing a meeting in one of the regions most affected: Latin America and the Caribbean. The interest in this subject on the part of institutions worldwide such as IDRC -through its Information Sciences Division- and UNESCO -through its General Information Programme (PGI)- coincided with that of regional institutions such as ECLA, CEPIS and others.

It was decided that ECLA would sponsor a meeting on the relation of microcomputers and bibliographic information systems, with the financial and technical help of IDRC and UNESCO/PGI. ECLA commissioned both its Computer Centre and the Latin American Centre for Economic and Social Documentation (CLADES) to undertake the responsibility to organize the meeting.

It was also agreed that, due to the pioneering character and the lack of distilled and organized knowledge on the subject, the gathering should endeavour at this stage to:

i) Convene experts in the field of microcomputers and bibliographic information systems in their personal capacity.

ii) Be carried out in an informal way so as to maximize the interchange of experiences and technical knowledge.

iii) Be restricted to a limited number of participants.

The need for such a meeting was emphasized by the many requests to attend received by the sponsoring institutions, in spite of the agreed-upon policy to restrict the number of participants and the deliberate lack of advance publicity about it.

The meeting took place at ECLA Headquarters in Santiago, Chile, from 24 through 27 April 1984. It gathered nearly 30 specialists from various national, regional and international organizations, together with more than a dozen observers. A list of participants is included as appendix 1. In order to facilitate the reading of the report a list of acronyms has been included as appendix 2.

The meeting followed the agenda shown in appendix 3, which had previously been agreed upon. The four days of the conference were filled with valuable technical discussions and a frank interchange of ideas among participants. Many papers were presented and software demonstrations carried out, as can be seen from appendices 4, 5 and 6, where abstracts of presentations, features of examined software packages and the list of distributed documents are included. In its final part, the discussions resulted in a series of conclusions and some recommendations related to the various objectives.

The sections that follow describe the meeting's objectives, their fulfillment and the conclusions and recommendations derived therefrom.

It is hoped that the wide distribution of this report -as the participants suggested- to the many potentially interested institutions in the region and elsewhere will contribute to the strengthening and broadening of the informal association that the meeting has created.

In retrospect, the conference can be seen as a first step of a continuous process of sharing of experiences and knowledge. Through this co-operation the region can hope to minimize the negative effects associated with this new technology while at the same time reaping the beneficial effects that these new microcomputer capabilities can bring about.

II. OBJECTIVES AND CONCLUSIONS OF THE MEETING

The meeting was conceived as a first step of a permanent regional effort oriented towards the attainment of the following objectives:

1. To identify and examine experiences with bibliographic information systems which have been implemented using microcomputers.

2. To discuss the basic functional specifications to be met by the software used in microcomputers in order to meet the needs of bibliographic information system users.

3. To review methodologies for analysing the advantages and disadvantages of existing software, both commercial and non-commercial, suitable for the retrieval and dissemination of bibliographic information using microcomputers.

4. To examine the feasibility of creating new software or adapting existing software so as to make the systems of the institutions of the region more accessible, compatible and portable, and to discuss the functional specifications which such software should meet.

5. To analyse the problems raised by data exchange and software set up in different microcomputers, with emphasis on standards for the structure and content of data.

6. To begin identifying co-operation schemes, including suitable mechanisms for technical assistance, training and research and development in order to resolve specific problems.

This section attempts to organize the presentations and discussions of the meeting according to the above stated objectives. In this way, it is hoped that an evaluation of the effectiveness of the meeting as a trigger event will be facilitated.

Objective 1: "TO IDENTIFY AND EXAMINE EXPERIENCES WITH BIBLIOGRAPHIC INFORMATION SYSTEMS WHICH HAVE BEEN IMPLEMENTED USING MICROCOMPUTERS"

Few bibliographic information systems so far have been fully implemented using microcomputers. Some of the existing experiences were discussed at the meeting. National and regional organizations made presentations and described their applications, successes and problems. The use of commercially available packages and the development of programmes to adapt commercial packages was emphasized.

Miss Judith Bohorquez described the use of dBase II in a bibliographic retrieval application in FUDECO for assisting with regional economic development in Venezuela. While the application is operational, the use of dBase II appears undesirable due to slow response times in an interactive mode to service end users.

Mr. Raúl Spina referred to the use of bibliographic data systems in Argentina and the efforts of CAICYT to co-ordinate and encourage proper use of bibliographic system tools such as thesauri, use of remote access to data bases, and assistance in hardware and software issues.

Mr. Michael Hewitt presented a paper prepared by Cuadra Associates on the CUADRA STAR system, a commercially available software and microcomputer hardware system available on a turnkey basis for bibliographic applications. The STAR system is user-friendly and has a very wide range of capabilities. It does not require a programmer for installation, applications design, or any functions of the system.

Mr. Jorge Gutierrez made a presentation on the Cardbox system. Cardbox is an inexpensive commercially available system used for a number of ECLA data base activities, including the CARISPLAN data base.

Mr. Roger Echeverria presented a comparison of dBase II and Cardbox in an application in ICAP to index articles from current public administration periodicals. The use of either data base system has advantages and disadvantages. Overall, Cardbox requires less disk space and runs significantly faster while dBase II offers more flexibility and is easier for the end user to utilize, provided programmer assistance is available.

Mrs. Marta Bryce discussed a computer application capable of operating the REPIDISCA data base under the sponsorship of CEPIS. The system uses a WANG 2200T for data entry and validation and then transmits data on diskettes to a remote IBM mainframe where the CDS/ISIS software package is installed, and there searching, bibliographic control, and publication formatting activities are carried out.

Mrs. Virginia Van Brunt presented and demonstrated a personal computer data base management system built on dBase II. Designed by A.I.D. to emulate some MINISIS functions for specific data base applications, this system has been tentatively called PCISIS. It includes an interface capability for uploading and downloading data from MINISIS installations. Although PCISIS was developed for use within A.I.D., it will be available to users in developing countries. The terms of availability have yet to be determined, and inquiries from interested institutions are welcomed.

Mr. Jaime de Mayo organized a demonstration of a software package developed by the Library System of the Universidad Católica of Chile. The demonstration took place at the University Campus and many participants were able to attend. The system is based on a microcomputer network and permits multiuser operation primarily devoted to the facilitation of cataloguing activities.

Mr. Antonio Ayesteran briefly informed the participants about an ongoing project at IBI-CREALC on designing a system based upon the AIDS package developed at IBI Headquarters in Rome. The system is being developed to support a regional bibliographic information network in the field of informatics. The system runs on DEC Rainbow microcomputers.

Some presentations were accompanied by papers and practical demonstrations on Cardbox and dBase II applications which illustrated the concepts and problems presented by the speakers. Technical discussions took place and issues were raised both by systems analysts and bibliographic systems administrators.

The absence of fully operational major applications of computerized bibliographic information systems using micros became apparent. So far a few component functions have been implemented, such as data entry interfaces with minis or mainframes (CARISPLAN, REPIDISCA) or cataloguing (U. Católica.)

Unfortunately, none of the participants had experience with fully-fledged software systems like the CUADRA STAR.

Finally, it was agreed that the relative low cost and easily available commercial systems might be good solutions for the automation of small documentation centres and libraries or as data entry interfaces with more powerful and expensive equipment. Although showing promise for the future, the present physical and logical limitations of these systems prevent their immediate utilization in bibliographic information networks, where normally 60 or more fields, variable length fields and extended records are required.

Objective 2: "TO DISCUSS THE BASIC FUNCTIONAL SPECIFICATIONS TO BE MET BY THE SOFTWARE USED IN MICROCOMPUTERS IN ORDER TO MEET THE NEEDS OF BIBLIOGRAPHIC INFORMATION SYSTEM USERS"

Functional specifications of appropriate potential software were discussed only to a limited extent.

Mr. Julio Ortuzar presented an outline of a data base structure and system functions for a proposed new bibliographic system. The specifications were based on a comparative study of different commercially available software carried out by Delta Systems, Inc.

Mr. Domingo Morales, in his presentation on commercially available software packages, included a review of functional requirements posed by four of the regional and international bibliographic information systems (BIREME, REPIDISCA, AGRINTER and DEVSIS) in response to a direct consultation. Functional requirements were indicated, specifying whether the functions were considered mandatory, desirable or optional.

Analysis of the replies produced the following preliminary conclusions: i) the pattern of functional needs differs greatly among bibliographic systems and ii) commercial software that satisfies the conjunction of all the stated needs seems not to be available at present. This means that the adoption of one of the existing packages is likely to involve some consciously accepted trade-offs.

On the whole, time constraints prevented an in-depth treatment of this subject of functional specifications. However, it became clear that further explorations and discussions on this matter, particularly among institutions responsible for regional bibliographic systems, are desirable.

Objective 3: "TO REVIEW METHODOLOGIES FOR ANALYSING THE ADVANTAGES AND DISADVANTAGES OF EXISTING SOFTWARE, BOTH COMMERCIAL AND NON-COMMERCIAL, SUITABLE FOR THE RETRIEVAL AND DISSEMINATION OF BIBLIOGRAPHIC INFORMATION USING MICROCOMPUTERS"

Two papers on software evaluation were presented and were followed by discussions.

Mr. Robert Valantin presented a paper written by Nicholas Kassem on software evaluation guidelines which could be a basis for carrying out actual evaluations of available packages. It is hoped the proposed conceptual scheme will be applicable to specific situations. Further testing and improvements are envisaged. The elaboration of guidelines has been an area of great interest on the part of IDRC.

Mr. Domingo Morales described the results of an evaluation of a variety of commercial packages relevant to bibliographic applications based on Kassem's methodology. After examining both turnkey bibliographic information packages and general data base management systems he rated the different products in the light of the computational environment and needs of his institution, IICA/CIDIA.

The topic of software evaluation was also analysed more extensively in the round table discussion.

On the one hand, the administrators of bibliographic information systems showed concern about the present state of affairs, where there is no pre-digested information on available software packages which is reliable, complete, up-to-date and easy to use. The decision makers usually have to review a large amount of technical information provided primarily by software vendors who tend to overemphasize the advantages of their products.

However, some administrators claimed that users will have to take decisions to buy or develop software soon and will not, in all likelihood, be prepared to wait until lengthy and costly evaluation exercises are completed.

On the other hand, many systems analysts remarked that in the short run it was difficult to expect ready-made, user-tailored answers relating to the evaluation of software packages. Several problems were mentioned, such as the lack of accepted and proven evaluation methodologies or guidelines and the need to undertake real tests on software in different hardware configurations, which would require considerable human resources, equipment

and money. Moreover, the evaluation exercise is complicated by the fact that it has to aim at a constantly moving target resulting from frequent innovations and changes in the international hardware/software markets.

The discussion also helped to clarify some issues.

For example, different types of evaluation-related activities were identified, such as:

i) compilation of inventories of existing software packages.
ii) Systematic review of the literature and particularly of software surveys.
iii) Inventories and comparative analysis.
iv) Actual test of pre-selected packages, installed in a particular hardware environment to assess real behaviour.

An institution could attempt to undertake one or all of these activities on its own, and it could establish co-operative links with other institutions to carry them out. It was also pointed out that the information derived from these activities would increase its relevance and cost of production if one moved from i) to iv).

To many, the construction of a mechanistic software evaluation model seemed very unlikely. Only the elaboration of general guidelines should be attempted at this stage. In this regard some caveats were mentioned: software selection is application specific, users' needs tend to vary widely, and a certain degree of subjectivity is likely to remain even if guidelines are utilized.

There was no agreement nor commitments on what types of software evaluation activities should be undertaken in the future. It was accepted, however, that at least some evaluation exercises should take place region wise.

For this, the universe of software that will be subject to regional scrutiny would need to be determined. Many data management of software packages that run on microcomputers are available. Of these, a smaller -but still quite large- subset might be capable of performing the processing for bibliographic and functionally-related applications. In view of the costs involved and type of potential buyers in the region some participants suggested that only packages costing under US$ 1,000 should be examined.

Other aspects such as the areas of bibliographic systems where software is to be applied also need to be specified (for example: is library management going to be included?).

Finally, many agreed that the methodological questions should be further examined. Guidelines are worthwhile pursuing, since they will help in avoiding or at least minimizing errors in software selection.

Objective 4: "TO EXAMINE THE FEASIBILITY OF CREATING NEW SOFTWARE OR ADAPTING EXISTING SOFTWARE SO AS TO MAKE THE SYSTEMS OF THE INSTITUTIONS OF THE REGION MORE ACCESSIBLE, COMPATIBLE AND PORTABLE, AND TO DISCUSS THE FUNCTIONAL SPECIFICATIONS WHICH SUCH SOFTWARE SHOULD MEET"

Many presentations dealt with this subject.

Mr. Abel Packer read a paper on the decentralization of bibliographic information networks. The need to consider the promotion of an autonomous technological capacity was advocated in the paper. The computer and documentation professionals of Latin America should endeavour to participate more actively in software selection, evaluation, design and implementation, rather than being mere spectators. The desirability of developing a new software package in Latin America as a means to develop such endogenous capabilities was suggested.

Ongoing or recently completed software development projects were then examined.

Mr. Terry Gavin presented a discussion on the data entry software being developed jointly by IDRC and CENAGRI. This software is intended to permit small documentation centres in a network to contribute references to a data base mounted on a computer at the network co-ordinating centre. However, no search or output facilities are available nor envisaged. The package, once completed and evaluated, will be available from IDRC.

In view of the fact that, once this data entry package is finished, IDRC will not do any further developments or enhancements and also will not give support to the package, Mr. Paulo H. A. Santana strongly recommended that IDRC choose one or more institutions, in the developing countries, to be trained to be the support installations for further development and distribution of the package.

Mrs. Luiza Koshino discussed the same software project from the perspective of a user institution (CENAGRI).

The meeting then explored a software package development effort sponsored by the General Information Programme (PGI) of UNESCO. Mr. Wolfang Lohner introduced UNESCO's plans concerning the use of a portable software system as part of a strategy for promoting the creation of local data bases in developing countries.

UNESCO/PGI is promoting the development and use of software packages for bibliographic and functionally-related non-bibliographic applications which implement internationally-accepted formats for the exchange of bibliographic data such as the UNISIST Reference Manuals (RM) for Machine-Readable Bibliographic Descriptions and for the description of Research Projects and Institutions and the Common Communication Format (CCF).

Assistance to developing countries will include the installation and maintenance of the appropriate software package, training in its use and, within the budgetary limits, provision of the hardware as well. Since developing countries that wish to establish mainframe or mini-computer based information systems can at present select from among a relatively large number of available packages, including CDS/ISIS or MINISIS, UNESCO's interest will focus in a first phase on portable software packages, for microcomputer-based systems.

A number of general features and specific applications requirements which a portable software package should fulfill have been identified internationally. In this context UNESCO has endorsed a package called IV + V (Information Vermittlung und Verarbeitung) as one software package which could correspond to the features required, and which would be likely to fulfill the portability criteria.

A UNESCO Consultant then described the technical characteristics of the IV + V package. Dr. Walter Koch, designer of the package, stated that the IV + V system has been under development at the Institute for Machine Documentation in Graz, Austria since 1979 in co-operation with the German Society for Documentation.

The system promises a high degree of portability across machines and endeavours to provide the full range of capabilities needed by bibliographic data systems users.

It will soon be implemented in several test sites as pilot projects -namely national institutions in Thailand, Tanzania, India, the United Nations Centre for Human Settlements in Kenya and UNESCO-PGI itself- and will be generally available in 12 to 18 months.

This presentation was supplemented by Mr. Harold Dierickx, reporting on his experience, as a UNESCO Consultant in implementing the UNISIST Reference Manual for Machine-Readable Bibliographic Descriptions (RM) on the IV + V system at the Institute for Social Studies in The Hague. He stated that the implementation of the Reference Manual on IV + V is still under development. So far, however, no major problems have been encountered. He was on the whole optimistic about the potential of IV + V to handle the kind of data structures required by the Manual.

The IV + V was demonstrated. The general impression was that this package could be suitable for the kind of applications required by the regional bibliographic information systems.

All presentations were immediately followed by discussions. Exchanges of viewpoints on this topic proceeded later, during the last day of the meeting.

There was some debate on the question of creating a new software system in the region. With the pending availability of IV + V it was felt that funding would be virtually impossible to obtain, and furthermore this new software system would not be available in a suitable time. All users who need software need it now, and are not likely to wait for 3 or more years for a new, unproven package.

The promise of the future potential availability of the IV + V package was then discussed. The general features and capabilities of the IV + V to handle efficiently various types of bibliographic and non-bibliographic data bases were highly appreciated by the participants. It was pointed out that IV + V could be considered as a viable solution for many information organizations, institutions and networks, and UNESCO was asked to develop and announce as soon as possible a strategy for its implementation in Latin America. Given the potentially very great number of users, the concept of establishing centres for its promotion at the national and/or regional level received strong support.

There was concern on some issues relating to the future of IV + V that remain to be resolved. Among these the following were mentioned: the terms of availability to users, the time schedule for availability of

various hardware and operating systems, and the question of how long the system will be supported by its developers and distributors, under what conditions, and to what extent.

In the light of the very great interest in IV + V the meeting formulated a specific set of recommendations to UNESCO on this topic.

Objective 5: "TO ANALYSE THE PROBLEMS RAISED BY DATA EXCHANGE AND SOFTWARE SET UP IN DIFFERENT MICROCOMPUTERS, WITH EMPHASIS ON STANDARDS FOR THE STRUCTURE AND CONTENT OF DATA"

The topics related to this objective were discussed at a round table organized on the last day of the meeting.

Standards and norms constitute an area of great concern for national, regional and international organizations. For a thorough analysis many facets would have had to be considered and technical details examined. The time available, however, prevented the participants from undertaking a systematic and in-depth analysis. Some areas of agreement were identified.

First of all, the reference document prepared by W. Lancaster under contract with UNESCO/PGI (UNESCO, 1983), on the issue of compatibility between information systems, was highly commended as a good introduction to the subject.

Aspects of bibliographic-type information systems development amenable to the adoption of standards and norms were then examined. Emphasis was given to data exchange formats and standards. However, other areas suitable for standarization were also mentioned such as character representation of data and file formats for exchange among various computer systems.

The discussion then centered on the ISO 2709 standard on data structures. In this regard it was pointed out that ISO 2709 forms the basis for each of the currently available and internationally used format families for bibliographic description: the UNISIST Reference Manual format, the UNIMARC format, and the Common Communication format.

Since ISO 2709 was designed for computer systems utilizing a magnetic tape memory, the possibility of straightforward applicability of the

standard to microcomputer systems mainly based on floppy-disks remained to be seen.

In view of the insufficient information on this problem it was suggested that studies and practical tests be undertaken by interdisciplinary teams incorporating both computer specialists and documentalists. The funding agencies expressed their willingness to consider proposals in this regard.

Nevertheless, for the time being the abandonment or modification of ISO 2709 should be ruled out because this would be premature and unrealistic.

The question of data exchange among bibliographic information systems which have adopted any of the 3 families of international formats was then explored. The need for some programming efforts to permit the easy conversion of data structured according to one format to another format was stressed. In this connection very little work seems to have been undertaken internationally.

Also, the hindrances to data exchange created by the diverse formats used for flexible disks which operate in microcomputer systems were discussed. Programming efforts would also be welcomed in this area. Unsurmountable technical problems are unlikely, and many benefits can be expected should these efforts be carried out according to co-operative schemes. There seems to be plenty of room for co-operation efforts in view of the fact that many of the problems are presently being addressed by various institutions on an individual ad-hoc basis.

The treatment of this subject led to only one general recommendation, the impression being that this topic deserves a meeting in its own right in the future.

Objective 6: "TO BEGIN IDENTIFYING CO-OPERATION SCHEMES, INCLUDING SUITABLE MECHANISMS FOR TECHNICAL ASSISTANCE, TRAINING AND RESEARCH AND DEVELOPMENT IN ORDER TO RESOLVE SPECIFIC PROBLEMS"

In this respect many participants made suggestions, clarified concepts and explicitly expressed willingness to co-operate. However, no firm commitments were made by participating institutions either as executing or as funding entities.

In the field of the use of microcomputers in bibliographic information systems two major criteria for tackling specific problems emerged:

(i) that actions should ideally be carried out through co-operative schemes;
(ii) that the institutions of the region should participate in ways whereby self-reliance can be increased.

Co-operation schemes were considered appropriate, particularly when many institutions with scarce resources are faced with similar problems. Co-operation was seen as an effective way to reduce institutional decision-making costs and to enhance interactions with externally generated technology.

Bearing in mind that the thrust of hardware/software developments in the microcomputer field is likely to come from industrialized countries, at least in the medium term, and that the institutions of the region will in any case be faced with decisions regarding hardware/software design, evaluation and implementation, different areas where co-operation schemes seemed feasible were identified:

(i) development and test of methodologies for evaluating software;
(ii) actual testing of software packages;
(iii) development and adaptation of software;
(iv) actions oriented towards facilitating data interchange;
(v) information dissemination on the above mentioned activities.

With respect to the first area -development and test of methodologies for evaluating software- it was considered desirable that the national, regional or international institutions likely to be systematically involved in the evaluation of software packages should be identified so that meaningful interchange of experiences in using guidelines could take place.

The IDRC software evaluation guidelines were considered a good starting point. Further experimenting and testing is needed, however, before their widespread use can be suggested. This type of methodology will systematize and reduce the subjectivity of evaluation exercises. The guidelines should be treated as proposals amenable to continuous improvement. IDRC welcomed the preparation of comments once the methodology is utilized by the participants.

The actual tests of software packages should include programmes which are:

(i) primarily devoted to the creation, data entry and searching of bibliographic data bases, thus allowing decentralization of networks based on minicomputers or mainframes;
(ii) commercially offered at low price (say not higher than US$ 1000) or delivered at no direct cost.

Given that software tests imply the availability of appropriate equipment and that a comprehensive range of hardware is not likely to be available in any particular place, the institutions of the region with computational capabilities should try to establish agreements tending towards an effective division of labour.

Software tests with segments of regional data bases in different software/hardware environments were considered important in order to assess the magnitude and nature of problems posed by the use of microcomputers.

The third area, i.e., the development of completely new software systems, was considered fruitful only for specific situations such as interchange of data files, etc., and not for including complete bibliographic data systems.

Instead of attempting the development from scratch of a completely new software package, it was suggested that efforts be focused on the completion of ongoing efforts.

Some participants, for example, expressed interest that the data entry package jointly developed by CENAGRI and IDRC be finalized, tested and disseminated in the region.

Similarly, the interesting features of the PCISIS system render the package attractive for further investigations.

Finally, pilot projects to test the IV + V system in Latin America were considered highly desirable.

The fourth area was data exchange between bibliographic information systems. Here it was suggested that a closer look be given to existing software related to format conversion, conversion of various magnetic storage devices, and data transmission which will permit the transfer of data to and from different data bases. Regional co-operation, perhaps

through a pilot project bringing together organizations leading regional information networks, was advocated.

Last but not least, information dissemination activities were considered essential for promoting co-operation in the region. The need to establish an information network for transferring experience in the use of microcomputers in bibliographic and functionally related work, including the evaluation component, was deemed important. Also, efforts should be made to publish and disseminate results and to make use of regional newsletters in informatics and related fields.

It was also noted that agencies should interchange information concerning microcomputer software development and information programs in the regions. The information provided by Frank Post of NTIS on the supply of software developed through United States Government sponsored research, and by IBI/CREALC on its project leading to the creation of a software package for handling textual information, are the kinds of useful developments deserving wider regional dissemination.

III. RECOMMENDATIONS

The participants agreed that recommendations be formulated in relation to three major areas: software evaluation, data exchange, and the future of the IV + V software package.

A. Software evaluation

Taking into account the importance to decision-makers and bibliographic information systems administrators of up-to-date, reliable and easy to use evaluative information on software packages suitable for operating bibliographic information systems and networks in Latin America, and

In view of the high costs involved in carrying out inventories, in-depth surveys and actual tests of such software packages,

It is recommended to the participants and all other related institutions that:

1. Efforts be made, by the institutions involved in inventorying, surveying and evaluating software packages, to publish and disseminate their findings and results to all other potential users of that information.

2. Advantage be taken of existing regional newsletters related to the field of informatics and information and documentation systems to disseminate current news about these efforts.

3. The evaluation paper "Commercial microcomputer data base management system software evaluation guidelines" by Nicholas Kassem, is a good guide to doing software evaluations. This document should be used, with modifications where necessary as indicated by actual experience in using it, as a standard evaluation guide.

Moreover, taking into account the high value of the international inventory of software packages in the information field as a software selection tool for developing countries, it is recommended to UNESCO that:

1. Efforts be made to ensure continuous updating of the inventory, emphasizing the identification of microcomputer software, and

2. Alternative access mechanisms to the inventory data base be facilitated, such as loose leaf updates, floppy disk distribution, etc.

B. Data exchange

Considering the importance of adhering to common or at least compatible standards and norms for information representation handling and transmission, and

Recognizing the generalized lack of information on the feasibility of utilizing existing standards and norms in the currently available microcomputer systems,

It is recommended to UNESCO/PGI, IDRC and other agencies in a position to supply funding, that they provide support for:

1. A technical study on the feasibility of utilizing existing standards and norms for the various components of the information transfer cycle, with particular emphasis on those related to bibliographic data exchange (such as ISO 2709), both among microcomputers and between microcomputers and larger systems.

C. Future of the IV + V software package

In view of the strong interest of participants in the concept and capabilities of the IV + V system for information handling,

Taking into account that the announcement of its pending availability at no cost to information systems and services in developing countries seems to preclude the use of commercial software packages in most national, international and regional information organizations in these countries.

Stressing the desirability that the IV + V system be fully developed, that its availability to Latin America be speeded up, and that its long-term support be ensured,

The following recommendations are adressed to UNESCO:

1. In addition to the IV + V test site at the UNESCO Regional Co-ordination Office in Caracas for the Regional Referral Network on Information Activities in Latin America and six other test sites in other developed and developing countries, other test sites in the Latin America region should be selected and supplied as soon as possible within the IV + V project scheme.

2. IV + V should be implemented under the UNIX operating system as soon as possible in order to further enhance its portability.

3. IV + V should be enhanced to support, on as many operating systems as possible, a multiuser environment where multiple users can simultanously access the same data base.

4. Considering the importance of continuing updating and maintenance, UNESCO should establish appropriate mechanisms to ensure these functions.

5. The status of, and news on, the system should be published regularly, if possible every three months.

6. UNESCO should announce as soon as possible its distribution and support strategy, including training facilities for both the use and implementation of IV + V.

APPENDICES

Appendix 1

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Appendix 2

LIST OF ACRONYMS OF INSTITUTIONS, INFORMATION NETWORKS AND SOFTWARE PACKAGES

Institutions

AID	:	U.S. Agency for International Development
BIREME	:	Biblioteca Regional de Medicina
CAICYT	:	Centro Argentino de Información Cientifica y Tecnológica
CELADE	:	Centro Latinoamericano de Demografia
CENAGRI	:	Centro Nacional de Informacao Documental Agrícola
CEPAL	:	Comisión Económica para América Latina
CEPIS	:	Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente
CERLAL	:	Centro Regional para el Fomento del Libro en América Latina y el Caribe
CIDIA	:	Centro Interamericano de Documentación e Información Agrícola
CLADES	:	Centro Latinoamericano de Documentación Económica y Social
CONICYT	:	Comisión Nacional de Información Cientifica y Tecnológica
CREALC	:	Centro Regional para América Latina y el Caribe del IBI
ECLA	:	Economic Commission for Latin America
FUDECO	:	Fundación para el Desarrollo de la Región Centro Occidental de Venezuela
IBI	:	International Bureau for Informatics
ICAP	:	Instituto Centro Americano de Administración Pública

IDRC	:	International Development Research Centre
IICA	:	Instituto Interamericano de Cooperación para la Agricultura
OEA	:	Organización de Estados Americanos
PGI	:	Programa General de Información de la UNESCO
UNESCO	:	United Nations Educational, Scientific and Cultural Organization

Bibliographic information systems and networks

AGRINTER	:	Sistema Interamericano de Información para las Ciencias Agrícolas
DEVSIS	:	Development Sciences Information System
DOCPAL	:	Sistema de Documentación sobre Población en América Latina
NTIS	:	National Technical Information Service
REDUC	:	Red Latinoamericana de Documentación en Educación
REPIDISCA	:	Red Panamericana de Información y Documentación en Ingeniería Sanitaria y Ciencias del Ambiente
UNISIST	:	Intergovernmental Programme for Cooperation in the field of Scientific and Technological Information

Software packages

CARDBOX	:	Commercial package available from Business Simulations Ltd.
dBase II	:	Commercial package available from Ashton-Tate
CDS/ISIS	:	Integrated Set of Information System. Version existing at UNESCO's Computerized Documentation Services
MINISIS	:	Mini Integrated Set of Information System
PCISIS	:	Personal Computer Integrated Set of Information Systems
IV + V	:	Informations Vermittlung und Verarbeitung
STAR	:	Commercial package available from Cuadra Associates Inc.

Appendix 3

AGENDA

1. Opening

   1.1 Opening addresses by representatives of the ECLA Executive Secretariat, IDRC and UNESCO/PGI

   1.2 Keynote address (CEPIS)

   1.3 Objectives and organization of the meeting (Secretariat of the Meeting)

2. Microcomputers and bibliographic information systems: methodologies and systems

   2.1 Methodological aspects of the design and evaluation of software

   2.2 Design and evaluation of specific packages

3. Experiences and projections in software utilization in bibliographic information systems

   3.1 Experiences of national bodies

   3.2 Experiences of regional bodies

   3.3 Round Table on regional efforts and projections

   3.4 Recommendations and conclusions

4. Adoption of recommendations and conclusions

5. Closure

Appendix 4

ABSTRACTS

Bohorquez, Judith
"Design of a data base through application of dBase II"

FUDECO, venezuelan regional planning and development body, is developing information activities within and outside of the institution and playing an important role in the storage and dissemination of information on the Centre-West region of the country.

A study on "Information Needs" is currently being conducted, for the purpose of effecting studies on demand and marketing of information; achieving closer contact with the user, incorporating the user into the regional information system (SIR) and obtaining data for decision making on information services of a cojunctural and permanent nature.

One of the phases of the study is the preparation of a data base of the SIR users' universe, utilizing the software of dBase II system; the information was divided into 3 data bases since it involved fields which will frequently be repeated for each user.

Experience has shown that the dBase II system is not very suited to working with information from different data bases, since the rapidity of response is very low; on-line searches were limited to consultations on fields within the same file. Consultations on different bases were carried out through printouts.

New developments for future applications within the institution are being considered.

Bryce, Martha
"Automation of the CEPIS Information System"

CEPIS is an OPS body offering technical co-operation through several programmes, including that of Information on Sanitary Engineering and Environmental Sciences, and is the Central Co-ordinating Unit for the

Pan-American Information and Documentation Network on Sanitary Engineering and Environmental Sciences (REPIDISCA).

The document indicates the stages in the processing of the information to be included in the data base and their products.

A WANG 220 T minicomputer with 16 KB memory and 20 MB storage is used, and programmes are developed in Basic 1.

To broaden and improve the quality of services, an IBM PC and a Hewlett Packard computer will soon be available.

CERLAL
"Automating the Regional Information System on Books and Reading in Latin America and the Caribbean"

CERLAL's experience in automating the Regional Information Service on Books, Reading and Copyright (SRI) in Latin America has gone through four stages since 1970. Initially, during stage one, both processing and filing were done manually. Later, in stage two, SRI's work was partially automated through the creation of specific files and batch processing. During stage three, ISIS was used, and a data base was incorporated into the system. As it was unable to continue utilizing ISIS, SRI began the fourth stage, with the assistance of IDRC, by clarifying its needs, linking itself up to the institutional memory and using microcomputers.

Echeverria, Roger
"Comparison of two programming packages for bibliographic data bases available for microcomputers"

This report is presented by ICAP, an international subregional body, composed of the six countries of the Central American isthmus, in charge of carrying out training and technical co-operation work for the public sector of that region. It promotes the development of information systems in those countries, attaching special importance to the aspect of data retrieval through computerized methods, utilizing microcomputer technology. The institution created the REVICAP data-base, which handles reprints of articles of 100 periodicals on public administration received by ICAP, as a service to the countries.

This data base is intended for distribution to the countries of the region in machine readable form. There will be careful selection of microcomputer equipment and of programming packages to be standardized.

For greater flexibility and interchangeability of data, general-purpose microcomputer equipment, operating under CP/M, was chosen.

The data base was originally created by utilizing the Ashton Tate dBase II and developing a series of ad-hoc programmes. Subsequently, at the suggestion of ECLA staff, the same base was created using Cardbox of Caxton. This report attempts to describe the data base and makes comparisons between the creation and utilization of the data base in the two abovementioned programming packages.

Ferreiro, Soledad
Arenas, Maria Luisa
De Mayo, Jaime
"Project on automation of the Library System of the
Catholic University of Chile"

The Library System of the Catholic University of Chile has developed a software package based on a set of microcomputers with the general objective of constituting a network of related libraries in the country to offer different services to their users and also to prepare administrative information for decision-making.

The system is currently developing cataloguing activities and consists of six subsystems: a) data entry; b) data base; c) inventory; d) consultation; e) emission of materials and f) listing of authorities.

The subsystems of Circulation, Acquisitions, Periodical Publications, Administration and On-line Catalogues are being studied for development in the near future.

Three IMS microcomputers set up according to the application for which they are used are available for the project implementation:

- TEI computer
- IMS 5000 computer
- IMS 8000 computer

For the management of the on-line catalogue and other applications, the computer used is Data General: MV - 4000 Processor with 2MB.

Software Uses TURBODOS operative system, compatible with CP/M and MP/M, with multi-user and multi-processor features, which makes possible a very high output, especially when user is working with an exclusive slave processor.

All the software for the cataloguing and automated circulation systems has been developed in PASCAL/M and MT+ language, which facilitates the development of software in bibliographic applications.

For some administrative applications the dBASE II package is used; the MDBS package was used to set up the consultation and inventory subsystems of the cataloguing system.

Gavin, Terry
"A data entry software development project in microcomputers"

This presentation describes the background, current status and future plans for the generalized microcomputer based data entry package being developed co-operatively by IDRC and CENAGRI. It was not the intention of this activity to develop a version of MINISIS to run on a microcomputer. The main purpose was to develop a generalized package that could be used by small documentation centres in a network to contribute references to a central processing site in machine-readable form.

The components of this package, implemented in the ISO subset of PASCAL, consist of a generalized data definition module to permit the definition of flexible, extendible data structures; a data entry and modification module; a generalized printing module to define print formats and display data; a module to produce data base output in a line format acceptable to the central processing site; and modules to perform the housekeeping functions for data base management and backup purposes.

Once the software development and evaluation are completed, by the end of this year, all of the software in source code form as well as the internal and user documentation will be made available free of charge.

Gutiérrez, Jorge
"Cardbox Plus"

Cardbox is a microcomputer programme distributed by Business Simulation Ltd., for the management of an electronic kardex file. It makes possible the definition of the format in which the information stored on each card should be displayed on the screen. It automatically maintains an inverted file with terms of access according to rules defined by the user, which makes possible an extremely rapid card selection according to criteria also defined at the time of use. The data may also be accessed through external files, whose format appears documented in the manuals, making it possible to produce more elaborate reports than those permitted by the programme's limited printing capacity. In addition, Cardbox files may be produced from existing data bases, such as ISIS. The latter may be used to disseminate bibliographic information to places which do not have access to the large computers required by ISIS, but which have microcomputers capable of maintaining Cardbox files.

Hewitt, Michael
"Hardware problems and trends in Latin America"

The presentation discussed the major trends in microcomputer equipment availability in Latin American countries.

On the issue of hardware selection the main considerations are hardware availability, software availability and hardware maintenance. For single user systems, the IBM PC and so called compatibles are currently dominating the market. While other good systems are available, it seems that most new software development is focused towards the IBM PC compatible market, therefore for a new user to have the maximum access to new software, the best choice may be an IBM PC or compatible.

Multiuser systems are more likely to be of interest in bibliographic work where decentralization of input and information services is desirable. The overall picture on multiuser systems in the region is not clear. At least ALTOS, ALPHAMICRO, and more recently, DEC configurations are being maintained in Latin America.

Little appropriate software for these systems is readily available, however.

Hardware maintenance seems to be good, at least in the areas where ECLA has direct knowledge of the situation. There are qualified technicians available and the companies are providing adequate documentation and spare parts to support an adequate level of maintenance. A problem area, however, is the repair of hard disks. Currently these cannot be fixed in Latin America, but must be shipped out of the region for repair.

The availability of and expanding use of UNIX may widen the range of hardware and software choices available in the future. UNIX is an operating system which is becoming more widely accepted as a standard and will provide software portability and hardware independence both for single and multiuser configurations.

Hewitt, Michael
"The Cuadra Star System"

The presentation was based on a document sent by Cuadra Associates.

STAR is a commercially available user friendly turnkey system for bibliographic applications. It has been designed to provide users with a tool which does not require a systems programmer for installation, applications design, or any functions of the system.

The functions available on the main menu screen are: data base definition, data entry, search and report, global change and system management.

A number of users can be performing any one or more of these functions in the same data base or in different data bases. The operation of the system is supported by well prepared documentation and help commands.

STAR operates on a 32 bits ALPHA MICRO computer, a powerful and easy-to-operate business computer with configuration choices ranging from the multiuser desk-top model (AM-1000) with 10 megabytes of hard disk storage, up to the fully expandable multiuser series of models (AM-100L) with starting disk capacity of 70, 140, or 400 megabytes. The equipment offers a complete security system to control the access to and operation of the data bases.

The system presents practically no limits regarding number of records and record length. A four user system with 30MB of hard disk, including hardware, software, terminals, printer, video recorder for backup of the

disk, and initial supplies, would likely cost about U$ 40.000 FOB California.

Kassem, Nicholas
"Commercial microcomputer data base management system software evaluation guidelines"

A series of guidelines to be used in the evaluation of commercial microcomputer data base management system software for bibliographic applications is proposed. A high-level functional specification for a "typical" bibliographic application is given as a focus for the evaluation. The features of software to be considered in the evaluation process are defined in both general and specific terms. They include: the user interface, data base definition, data base population, data modification, data retrieval, arithmetic computation, output generation, data integrity, utilities and special features, the software and hardware environment, and data transfer. Particular characteristics of these functions which are useful for evaluation purposes are identified. The emphasis throughout is on the discussion of possible discriminating factors, rather than on mechanistic procedures to be followed in carrying out an actual evaluation. However, two sets of forms for "paper" evaluations are presented. One of these contains the results of an evaluation of a well-known data base management package as it could be applied to a "DEVSIS-like" system.

Koch, Walter
"Description of the IV + V system software package"

The Second Medium-Term Plan of UNESCO, as well as the Organization's Programme and Budget for 1984-1985, foresee the provision, free of charge to developing countries, of portable microcomputer software packages to support their efforts in establishing local data bases and modern information systems and networks.

The IV + V System software package, currently under development at the Institut fur Maschinelle Dokumentation (IMD) in Graz (Austria), has been identified as complying with the technical criteria set up by UNESCO for the above purpose. A few pilot installations are foreseen in 1984-1985, while negotiations are underway between UNESCO and IMD on an agreement regarding free distribution through UNESCO to developing countries, installation, and training in the use and maintenance of the system.

Koshino, Luiza
"CENAGRI and a pilot implementation network"

CENAGRI is the agricultural information and documentation body of Brazil. It acts as co-ordinator of the SNIDA and is a participant in AGRIS and CARIS, serving users from the Ministry of Agriculture and the public in general. It is connected to the bodies and users of the area through the 12 CENAGRI and 265 co-operating centres in the country.

Currently the CENAGRI information system is chiefly based on external computers, which raises problems of low priority, slowness and high costs. The development of a system which will solve these problems and which it will be possible to install in remote regions of Brazil has become a priority project. The means that have been chosen consist of a system based on a microcomputer installed in CENAGRI with a network of microcomputers, connected to microfilm and telex reader-copiers in the different States of Brazil, through alternative use of a large computer and also a Brazilian microcomputer specialized in management of telex networks.

Mainly the following equipment will be used:

- SID 5800 minicomputer, based on LOCABAX
- Brazilian microcomputers. Microprocessor INTEL 808 X
- Burroughs B 6900 computer
- PC 2100 microcomputer.

The software, based on a mini-and microcomputer environment, is the result of development of the INTEGRAI project carried out jointly with the IDRC, and strives to have general and "user-friendly" modular software as far as possible.

This software should be completed at the end of 1984.

Morales, Domingo A.
"Evaluation of commercial microcomputer software for use with bibliographic information systems"

The study addresses the question of whether commercial microcomputer software is useful for in-house bibliographic information work at the Inter-American Centre for Agricultural Documentation and Information (CIDIA). Products are classified broadly as turnkey bibliographic

information packages, or as general data base management systems. Their overall fitness is estimated by examination of their functional features against a pre-established set of requirements associated with each category. Aspects of performance other than functionality are disregarded, and no assessment is made whatsoever as to the effectiveness of the software outside the specific area of concern. Although the accuracy of the estimates depends largely on product literature available at the time of this "paper" evaluation, a small number of them stand out clearly as potentially applicable. Apparently, none of the bibliographic packages meet the various requirements completely, in spite of their excellence; this statement needs to be confirmed quickly by follow-up research on the few best suited. Only a few products of the data base management systems line are worth further attention, since requirement levels in the scope of bibliographic information applications seem rather high still; some of them qualify very well as a base for a serious, even fast, development undertaking, as an alternative, or should the turnkey bibliographic information packages prove unsatisfactory. In either case, the usefulness of commercial microcomputer software is NOT to be ignored for such applications. Some experimentation is required now; a short list of candidate product names is presented to this effect for each category of software.

Ortúzar, Julio
"DBIRS: Data base information retrieval system"

Delta Systems Inc. presented a project for developing a microcomputer-oriented data base management system particularly suitable for bibliographic data bases and functionally related applications.

The programmes will be easy to use, portable, multiuser and able to retrieve texts and documents.

The overall design of the system was based on a detailed comparative study of other available commercial systems so as to ensure that its specification includes most of the functions available in other systems as well as the commands most frequently utilized.

The system is to be independent of hardware configuration and operating system. It will use commonly available operating system features and widely available compilers. It will operate efficiently using variable length records, variable length fields and fields of variable occurrence. A security feature will also be available to restrict access to the data bases.

Finally, the system is being designed to have the capacity to display command information as well as error messages and help information at the bottom of the screen.

Packer, Abel
"Microcomputers and decentralized networks as a means of developing autonomous capacity"

This report focusses on the decentralized functioning of regional information networks or systems in the fields of planning, population, environment and health, as a contribution to discussions on the use of microcomputers in the processing of bibliographical information in the region. It theorizes that the true development of the countries of Latin America lies in self-training and thus achieving control over the development instruments suited to each country.

As a specific example, it mentions the study and implementation of a common methodology for treatment of information in the bibliographic information services of ECLA based on UNISIST, which is being adopted by other regional systems, thus promoting the establishment of decentralized networks, as an efficient mechanism in the transfer of bibliographic information. The adoption of microcomputers in the administration of medium-sized and small data bases is also recommended because of their low cost.

The report warns that a lack of definite policies and resources for computer use could produce negative situations in the process of decentralizing the networks.

It proposes that institutions in Latin America, such as ECLA, BIREME, CEPIS, etc., should formulate a joint project and develop software capable of managing the common methodology and terminology already developed by ECLA.

Page, William S.
"Transcode. A methodology for the development of transportable software"

A methodology for developing transportable software based on a simple programming language translation scheme is presented. It is shown how an application-specific high level language can be designed which can be easily translated to any one of a number of selected target languages on different

computer systems. All software for a project, including the language translation software itself, is written in the newly designed language. The problem of transporting the whole software system then reduces to the problem of transporting the language translator. This latter problem can be approached using a "bootstrap" technique to minimize the time required to have an operational translator.

Post, Frank
"Regional technical information exchange: the NTIS network"

The National Technical Information Service (NTIS) is an autonomous, self-supporting agency of the U.S. Department of Commerce. NTIS is the source of technical report literature, computer software, data bases, and patents resulting from U.S. government sponsored research.

NTIS has produced a bibliographic data base which presently includes more than 900.000 citations dating since 1964. As a producer of data bases, NTIS is interested in the impact of microcomputers in the market place.

NTIS has an additional responsibility to be sensitive to the needs of the Latin American market due to a regional project it manages with financing by USAID. This project unites NTIS with 23 agencies in the region for the purpose of promoting the access to and use of technical information of local and foreign origin.

AID has assigned a modest budget, within this project, for the automation of data base creation and access. The intention is to use microcomputers for routine office and project management in addition to bibliographic and functionally related services.

Spina, Raúl
"Use of computers: Experience of the Argentine Centre for Scientific and Technological Research (CAICYT)"

This paper describes the development of recent projects and activities which are directly related to the use of CCPP computers. An automated reference file is involved, containing approximately 45 000 titles of periodicals belonging to more than 400 Argentine libraries. Structured as a data base, it makes possible interactive retrieval from various fields, one of which is an ISSN loaded through a "merge" between the ISDS (CEPIS) master publications file and the Argentine file.

At the same time, another regional project is being carried out with FID/CLA, which consists of the creation of material for training to access to data base services; the system is designed for a microcomputer and simulates the retrieval programmes for these services in a small bibliographic file.

The use of a manual, also on line, completes this self-instruction.

Data base and indexing language consultancy groups collaborate and give assistance in the area of studies and training. Topics of permanent priority are: data management, thesauri, training of human resources, telecommunications, software and hardware.

Van Brunt, Virginia
"PCISIS: a bibliographic data base management system"

The U.S. Agency for International Development, Bureau for Program and Policy Coordination, Development Information and Utilization Service (AID/PPC/E-DIU) is developing a bibliographic data base management system (PCISIS) based on a customized version of dBase II (Versions 2.3 or 2.4) designed to run on an IBM PC/XT using DOS 2.0 or DOS 2.1. The data base contains variable length records and subfielded fields, as suggested in the model for development information systems proposed by IDRC. Functionally, the user view of the data base emulates IDRC's MINISIS software. The purpose of this application is to transport AID's Development Information System (DIS), currently residing in a HP3000/MINISIS configuration in Washington DC, to LDC institutions and AID missions. Subsets of the DIS can be downloaded by subject or geographic area. The system is currently being field tested for cataloguing documents within a mission environment. AID plans to install PCISIS in selected LDC institutions within the next 12 months.

Valantin, Robert
"Software for bibliographic applications on microcomputers:
Where do we go from here?"

The predicament faced by information professionals and users wishing to acquire software for bibliographic applications on microcomputers is placed in perspective. The development of information management software is traced from mainframe to minicomputer environments, and factors to be considered in examining whether or not the situation is similar for microcomputers are identified. Some relevant characteristics of the

microcomputer software industry and marketplace are presented. The need for the evaluation of commercially-available software is discussed, and inherent problems are identified. It is suggested that the current meeting should examine various approaches to some of these issues, and attempt to find the means for the on-going exchange of information on these topics.

Appendix 5

FEATURES OF SOFTWARE PACKAGES DEMONSTRATED

Six software packages were demonstrated at the meeting. Some are of a commercial nature; others can be obtained free of cost.

Tables are presented therein for facilitating a general comparative analysis. Detailed information can be directly obtained from the software distributors at the addresses provided at the bottom of the tables. Some additional information is available in the abstracts of presentations included in appendix 4.

Information presented is sketchy. No indication on performance has been given, since this strongly depends on the particular hardware/software configuration utilized.

All these packages were seen to work in the following computational environments:

CARDBOX:	IMSAI 8080; CP/M op. system
dBASE II:	IMSAI 8080; CP/M op. system
STAR:	Remote ALPHA MICRO installation (California) accessed through Televideo 750 Terminal linked to TELENET
PCISIS:	IBM PC/XT; DOS op. system
UC Software:	IMS 5000; TURBODOS op. system
IV + V:	PDP 11-34; RS-11 op. system

Table 1: SOFTWARE PACKAGES DEMONSTRATED

	PACKAGE FEATURES	CARDBOX	dBASE II	STAR
A.	PHYSICAL LIMITS			
	* Records/data base	65500	65535	Unlimited
	* Characters/record	1404	1000	Unlimited
	* Fields/record	26	32	Unlimited
B.	HARDWARE/SOFTWARE REQUIREMENTS			
	* CPU Processor	Z80 8086/88	Z80 8086/88	ALPHA MICRO AM 100/T
	* Operating System	CP/M MS.DOS MP/M TURBODOS	CP/M MS.DOS MP/M TURBODOS	AMOS
C.	AVAILABILITY	Immediate	Immediate	Immediate
D.	COST	US$ 400-600	US$ 700	US$ 10000-50000
E.	CONTACT FOR FURTHER INFORMATION	Business Simulation Ltd. Scriventon House Speldhurst Tunbridge Wells Kent TN30TU ENGLAND	Ashton-Tate 10150 West Jefferson Blvd. Culver City California 90230 UNITED STATES	Cuadra Associates 2001 Wilshire Blvd. Suite 305 Santa Monica California UNITED STATES

(Cont. Table 1)

PACKAGE FEATURES	PCISIS	UC	IV + V
A. PHYSICAL LIMITS			
* Records/data base	65535	65535	Unlimited
* Characters/record	Unlimited	2560	Unlimited
* Fields/record	Unlimited	Unlimited	Unlimited
B. HARDWARE/SOFTWARE REQUIREMENTS			
* CPU Processor	Same as dBASE II	Z80	Z80 8086/88 LS11
* Operating System	Same as dBASE II	TURBODOS	Potentially portable to many computs.
C. AVAILABILITY	Needs further development	Inquire	Needs further development
D. COST	No direct costs	Inquire address below	No direct costs
E. CONTACT FOR FURTHER INFORMATION	US/AID 7222 47th. St Suite 100 Chevy Chase MD 20815 UNITED STATES	Sistema de Bibliotecas U. Católica V. Mackenna 4860,Santiago CHILE	PGI UNESCO Place de Fontenoy Paris 7, FRANCE

Appendix 6

DOCUMENTATION DISTRIBUTED

1. Basic Documents

   - Tentative agenda
   - Tentative programme
   - List of participants
   - Descriptive document on the meeting

2. Technical Presentations

Bohorquez, Judith	- Diseño de una base de datos aplicando el dBase II.
Bryce, Martha	- Automatización del Sistema de Información del CEPIS.
Echeverría, Roger	- Comparación de dos paquetes de programación para bases de datos bibliográficos disponibles para microcomputadores.
Institute for Machine Documentation	- Description of the IV + V System Software Package.
Kassem, Nicholas	- Commercial Microcomputer Data Base Management System Software Evaluation Guidelines.
Koshino, Luiza	- O CENAGRI e a rede piloto de implementacao
Morales, Domingo A.	- Evaluation of Commercial Microcomputer Software for use with Bibliographic Information Systems.
Spina, Raúl	- Uso de computadores: Experiencia en el Centro Argentino de Información Cientifica y Tecnológica (CAICYT).
Packer, Abel	- Los microcomputadores y las redes descentralizadas: en defensa de nuestra autocapacidad.

Page, William S. - Transcode: A Methodology for the Development of Transportable Software.

Post, Frank - Regional Technical Information Exchange: The NTIS Network.

Valantin, Robert - Software for Bibliographic Applications on Microcomputers: Where do we go from here?.

Van Brunt, Virginia - PCISIS: A bibliographic data base management system.

Documents for Reference

Brahm, Luis y Gutiérrez, Gonzalo - REDUC: Una red de documentación en educación al servicio del desarrollo en América Latina. EUCIBA, v. No. 2.

Business Simulation Ltd. - Cardbox Plus, 1983.

CERLAL - Experiencia de automatización del Servicio Regional de Información sobre el Libro y la Lectura en América Latina y el Caribe dentro del CERLAL. 1984.

Cuadra Star Inc. - Excerpts from the STAR Manual, 1984.

ICAP - Base de datos de articulos de Revistas de Administración Pública, REVICAP, 1983.

UNESCO/PGI - International Inventory of Software Packages in the Information Field. Paris, 1983.

UNESCO/PGI - Compatibility Issues affecting Information Systems and Services. Paris, 1983.